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Nedim Fresko

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MARSH FISCHMANN & BREYFOGLE LLP
8055 E. Tufts Avenue, Suite 450
Denver, CO 80237

EXAMINER

HICKS, MICHAEL J

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/821,468	Applicant(s) FRESKO ET AL.	
	Examiner MICHAEL J. HICKS	Art Unit 2165	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-27 and 29-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-27, and 29-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-10, 12-27, and 29-33 Pending.

Claims 11 and 28 Canceled.

Response to Arguments

2. Applicant's arguments, see response, filed 3/15/2010, with respect to the rejection(s) of claim(s) 1-31 under USC 102 and 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kolodner et al. (US Patent Number 6,490,599, Issued 12/2002).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-10, 12-27, and 29-33 Pending rejected under 35 U.S.C. 102(b) as being anticipated by Kolodner et al. (US Patent Number 6,490,599, Issued 12/2002 and referred to hereinafter as Kolodner).

As per Claim 1, Kolodner discloses a method in a data processing system having a program for allocating objects in a memory portion that includes a Young Generation

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and at least one Older Generation, said method comprising: (a) for each of the objects, determining whether at least one object should be allocated in said Young Generation in accordance with a first promotion policy exercised for promoting objects from said Young Generation to an Older Generation of said memory portion (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a first promotion policy designated objects as either black (e.g. in the old generation), gray (in the young generation, but to be promoted to the old generation after a collection cycle), white (in the young generation and to be collected), or yellow (new objects not to be collected and to be assigned to the young generation after collection).); (b) based on the determining whether each of the objects should be allocated using the first promotion policy, determining whether said at least one object should be allocated in said Young Generation in accordance with a second promotion policy exercised for at least postponing promoting objects from said Young Generation to said Older Generation relative to the first promotion policy (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); and (c) storing each of the objects in said Young Generation in accordance with said first or second promotion policy (See Column 10, Lines 9-19, 26-34, and 44-59 in addition to Column 12, Lines 25-46 which clearly indicate that that the objects assigned to the young generation are allocated in the young generation in accordance with both policies.), and providing an indication of said second promotion policy in a header for a subset of the objects, the indication used during a promoting step to preempt use of the first promotion policy (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly

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indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7.).

As per Claim 2, Kolodner discloses said determining (a) of whether at least one object should be allocated in accordance with a first promotion policy comprises: determining whether said at least one object is used as temporary data (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that objects marked as white objects are determined to be objects in the young generation which do not have a dependency on an object in the older generation, which may be interpreted as the objects being temporary data.).

As per Claim 3, Kolodner discloses said determining (a) of whether at least one object should be allocated in accordance with a first promotion policy comprises: determining whether said at least one object is garbage (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that the color marking of objects occurs in a garbage collection operation.).

As per Claim 4, Kolodner discloses said at least one object can be garbage within an acceptable time period (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that objects marked as yellow are indicated to be objects for which an acceptable time period has not elapsed to allow the objects to be marked as garbage.).

As per Claim 5, Kolodner discloses said determining (a) of whether at least one object should be allocated in accordance with a first promotional policy comprises:

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determining whether said at least one object is garbage (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that the color marking of objects occurs in a garbage collection operation.).

As per Claim 6, Kolodner discloses said determining of whether said at least one object is garbage determines whether at least 50% of said at least one object is garbage (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that each object is considered in its entirety in terms of whether it maintains any pointers. As such a determination that an object should be marked as garbage inherently entails a determination that at least 50% of the object is garbage, as it is determined that the entire object is garbage.).

As per Claim 7, Kolodner discloses said determining (a) of whether an object should be allocated in accordance with a first promotion policy comprises: determining whether system code is allocating said object (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that each object is considered in its entirety in terms of whether it maintains any pointers. Examiner notes that if an object is allocated by system code it will the object will maintain pointers.); and wherein said method further comprises: selecting a second promotion policy that postpones the promotion of said at least one object with respect to other objects allocated in accordance with said first promotion policy (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 8, Kolodner discloses said determining (a) of whether an object should be allocated in accordance with a first promotion policy comprises: determining whether one or more of the following operations are being performed: loading a class, parsing a file that represents a class, dynamic compilation, and a call to a library function that generates temporary data (See Column 3, Line 62 – Column 4, Line 5 and Column 7, Lines 31-36 which clearly indicate that a memory object refers to an entity in the memory that is allocated by a thread. Examiner notes that the thread which is allocating the memory object may be a thread associated with any of the above claimed operations.).

As per Claim 9, Kolodner discloses said class is Java TM compliant class represented in a class file, said dynamic compilations are performed in Java TM compliant run time environment, and said library function is Java TM compliant library method (See Column 14, Lines 46-48 which clearly indicate that the disclosed method of garbage collection may be used in a Java environment.).

As per Claim 10, Kolodner discloses said Java TM compliant library method is associated with concatenation of Java TM strings (See Column 14, Lines 46-48 which clearly indicate that the disclosed method of garbage collection may be used in a Java environment.).

As per Claim 12, Kolodner discloses said header includes a preemption indicator that indicates a garbage collection count should be preempted and said at least one object should not be promoted to said next generation (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent

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promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 13, Kolodner discloses said header includes a preemption indicator and a preemption value (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); wherein said preemption indicator indicates that a garbage collection count should be preempted (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); wherein said preemption value provides a preemptive garbage collection count that is used instead of a garbage collection count (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 14, Kolodner discloses said header provides a garbage collection count to determine when said at least one object should be promoted from said Young Generation to said Older Generation (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7.).

As per Claim 15, Kolodner discloses a computer system, comprising: at least one processing unit; a memory portion that is partitioned into a Young Generation and at least one Older Generation (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a young generation and an old generation are defined.); a first memory allocator that operates to allocate one or more objects in said Young Generation in accordance with a first promotion policy for promoting said one or more objects from said Young Generation to an Older Generation in said memory (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a first promotion policy designated objects as either black (e.g. in the old generation), gray (in the young generation, but to be promoted to the old generation after a collection cycle), white (in the young generation and to be collected), or yellow (new objects not to be collected and to be assigned to the young generation after collection).); and a second memory allocator that operates to allocate one or more other objects in said Young Generation in accordance with a second promotion policy for postponing promoting said one or more other objects from said Young Generation to an Older Generation in said memory relative to the promoting performed in accordance with the first promotion policy (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.), wherein the one or more other objects are being allocated by system code or are associated with an operation predefined as likely to generate garbage (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that each object is considered in its entirety in terms of whether it maintains any pointers. Examiner notes that if an object is allocated by system code it will the object will maintain pointers.).

As per Claim 16, Kolodner discloses an allocation interface that can be used to access both said first and second memory allocators, wherein, said allocation interface operates to use said first or second memory allocators in accordance with an allocation selection (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7. Examiner notes that the age count is associated with and therefor indicative of the second promotion policy, and that the determination consists of determining whether the object has an associated age count and delaying promotion of the object according to the second promotion policy.), and an allocation switching function that can be used to switch said allocation selection from said first memory allocator to said second memory allocator (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7. Examiner notes that the age count is associated with and therefor indicative of the second promotion policy, and that the determination consists of determining whether the object has an associated age count and delaying promotion of the object according to the second promotion policy.).

As per Claim 17, Kolodner discloses said first and second memory allocators can be directly accessed (See Column 2, Lines 49-61 which clearly indicate that the collector has direct access to the first and second promotion policies.).

As per Claim 18, Kolodner discloses said processing unit: determines whether at least one object should not be allocated using said first memory allocator in said Young

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Generation in accordance with said first promotion (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a first promotion policy designated objects as either black (e.g. in the old generation), gray (in the young generation, but to be promoted to the old generation after a collection cycle), white (in the young generation and to be collected), or yellow (new objects not to be collected and to be assigned to the young generation after collection).); and determines said second promotion policy used by said second allocator when it is determined that at least one object should not be allocated in said Young Generation in accordance with said first promotion (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 19, Kolodner discloses said second allocator allocates at least one object with a header that indicates said second promotion policy (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7. Examiner notes that the age count is associated with and therefor indicative of the second promotion policy.).

As per Claim 20, Kolodner discloses said header includes a preemption indicator indicating that a garbage collection count should be preempted and said at least one object should not be promoted to said next generation (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 21, Kolodner discloses said header includes a preemption indicator and a preemption value (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); said preemption indicator indicates that a garbage-collection count should be preempted (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); and said preemption value provides a preemptive garbage collection count that is used instead of said garbage collection count (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 22, Kolodner discloses said header provides a garbage collection count that is used to determine when said at least one object should be promoted from Young Generation to said Older Generation (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7.).

As per Claim 23, Kolodner discloses a garbage collector that reads said header and promotes said at least one object in accordance with said header (See Column 12,

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Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7.).

As per Claim 24, Kolodner discloses said garbage collector delays or avoids promotion of said at least one object with respect to objects allocated with said first allocator (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 25, Kolodner discloses said computer system is a virtual machine (See Column 14, Lines 46-48 which clearly indicate that the disclosed method of garbage collection may be used in a Java environment.).

As per Claim 26, Kolodner discloses said computer system is a Java TM compliant virtual machine (See Column 14, Lines 46-48 which clearly indicate that the disclosed method of garbage collection may be used in a Java environment.).

As per Claim 27, Kolodner discloses said computer system is provided for a handheld, an embedded, or mobile device (See Column 6, Lines 10-34 which clearly indicate that the operating environment of the system is a computer system having a memory. Examiner notes that this may be interpreted as any of a handheld, an embedded, or a mobile device.).

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As per Claim 29, Kolodner discloses a computer readable storage medium including computer program code for allocating objects in a memory portion that includes a Young Generation and at least one Older Generation, said computer readable medium including comprising: computer program code for allocating one or more objects in said Young Generation in accordance with a first promotion policy exercised for promoting objects from said Young Generation to an Older Generation of said memory portion (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a first promotion policy designated objects as either black (e.g. in the old generation), gray (in the young generation, but to be promoted to the old generation after a collection cycle), white (in the young generation and to be collected), or yellow (new objects not to be collected and to be assigned to the young generation after collection).); and computer program code for allocating one or more other objects in said Young Generation in accordance with a second promotion policy exercised for postponing or cancelling promoting objects from said Young Generation to an Older Generation of said memory portion (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.), wherein, each of said one or more objects includes a header that indicates said second promotion policy (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7. Examiner notes that the age count is associated with and therefor indicative of the second promotion policy.).

As per Claim 30, Kolodner discloses said second promotion policy is not to promote said one or more objects from said Young Generation to said Older Generation of said memory portion (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 31, Kolodner discloses said second promotion policy is to delay the promotion of said one or more other objects with respect to objects allocated under said first promotion policy (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

As per Claim 32, Kolodner discloses a computer readable storage medium including computer program code for allocating objects in a memory portion that includes a Young Generation and at least one Older Generation, said computer readable medium including comprising: computer program code for allocating all of the objects into said Young Generation in accordance with either a first promotion policy exercised for promoting objects from said Young Generation to an Older Generation of said memory portion or a second promotion policy exercised for promoting objects from said Young Generation to an Older Generation of said memory portion (See Column 10, Lines 9-19, 26-34, and 44-59 which clearly indicate that a first promotion policy designated objects as either black (e.g. in the old generation), gray (in the young generation, but to be promoted to the old generation after a collection cycle), white (in the young generation and to be collected), or yellow (new

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objects not to be collected and to be assigned to the young generation after collection). See also Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.), wherein the second promotion policy defines a longer tenure for the objects in the Young Generation than the first promotion policy (See Column 12, Lines 25-46 which clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.); and computer program code for promoting live ones of the objects allocated in the Young Generation to the Older Generation (See Abstract which clearly indicates that the promoted objects are live objects as the garbage collection is done on the fly.), the promoting being performed for each object involving first determining whether the object was allocated using the first or the second promotion policy and second applying the determined one of the first and second promotion policies (See Column 12, Lines 25-26 which clearly indicate that the age value is a parameter, and Column 7, Lines 38-42 which clearly indicate that the age value may be stored in any known data structure, which would include an object header, as disclosed in Column 8, Line 45 – Column 9 Line 7. Examiner notes that the age count is associated with and therefor indicative of the second promotion policy, and that the determination consists of determining whether the object has an associated age count and delaying promotion of the object accordingly.).

As per Claim 33, Kolodner discloses said first promotion policy comprises assigning a value to a garbage collection count and wherein said second promotion policy comprises assigning a pre-emptive count value to the object that defines the longer tenure for the object in the Young Generation (See Column 12, Lines 25-46 which

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clearly indicate a second promotion policy which assigns an age value to each object and prevent promotion of the object from the young generation to the old generation until it has undergone a specified number of collection cycles.).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Hicks whose telephone number is (571) 272-2670. The examiner can normally be reached on Monday - Friday 9:00a - 5:30p.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Neveen Abel-Jalil can be reached at (571)272-4074. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Hicks/
Examiner, Art Unit 2165
Phone: (571) 272-2670
Fax: (571) 273-2670

/Neeven Abel-Jalil/

Supervisory Patent Examiner, Art Unit 2165